X-Plain™
Bronchoscopy
Reference Summary

Introduction

A bronchoscopy is a medical procedure that uses a scope to look inside the airways. It allows your doctor to diagnose and, in some cases, treat problems.

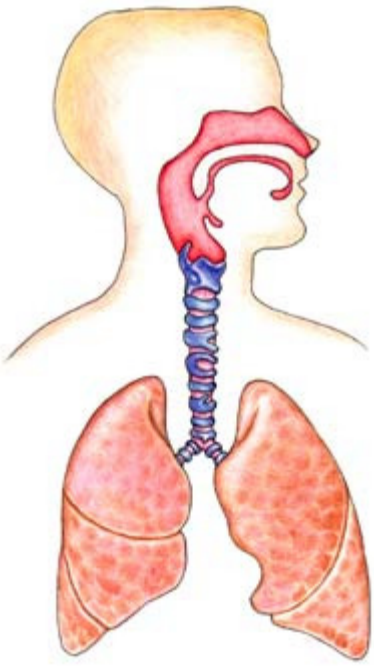
Your doctor has recommended that you have a bronchoscopy. The decision to have this procedure is also yours.

This reference summary explains bronchoscopy. It discusses the benefits and risks and what to expect after the procedure.

Anatomy

A bronchoscopy is a special technique for looking inside the airways. This section reviews the anatomy of the respiratory system.

The lungs allow us to fill our blood with oxygen. The air we breathe in comes in close contact with the blood in the lungs. When we breathe in, the air goes through the mouth and nose. From there it goes to the larynx and then through the vocal cords to the air pipe, known as the trachea.



From the trachea it goes into a number of increasingly smaller tubes, called bronchial tubes.

Small balloon like sacs called alveoli are at the end of the bronchial tubes. The alveoli are very thin, allowing oxygen to go into the blood and carbon dioxide to go from the blood to your lungs to be breathed out.

The inner lining of the bronchial tubes secrete special substances called mucus.

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The mucus helps trap dirt from the air. Mucus is continuously expelled from the lungs. Very small brushes, known as cilia, on the outside of the lung cells continuously push the mucus to the outside. Most of the time it is pushed automatically. If the mucus however becomes too big, it can be coughed out.

Bronchoscopy

The doctor uses a bronchoscope during bronchoscopy. A bronchoscope is a long, thin, and flexible fiberoptic tube that transmits pictures from the tip to an eyepiece or to a video set.

During a bronchoscopy, the bronchoscope is used to look at the larynx, trachea, and bronchial airways of the lungs.

This procedure shows more details from the inside of the airways than pictures taken with X-rays.

The bronchoscope has an open channel. This allows instruments to go through the scope and be used to take tissue samples, cauterize bleeding, or remove thick mucus blocking the airways.

The doctor that performs the bronchoscopy procedure is a pulmonologist, a specialist in the respiratory system.

A bronchoscopy can be used to examine many different respiratory tract symptoms. These include pain the in the trachea, difficulty breathing, bleeding, tumors, and chest pain. Clear and detailed images and video projected on a monitor helps the doctor diagnose problems.

In some cases, a bronchoscopy can be used to treat the problem. For instance, if a growth is obstructing breathing, it can be removed. A bronchoscopy can also be used to remove things that were accidentally inhaled into the airways.

If any cancerous growths are found they can also be taken out for further examination. This is a called a biopsy. Biopsies are also done to test for certain bacteria that cause lung infections or pneumonia.

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Your doctor will tell you the reason why a bronchoscopy has been recommended for you.

Preparation

A bronchoscopy is usually an outpatient procedure. This means you will go home after the procedure. It can be done in the physician's office, a pulmonology clinic, or at the hospital.

You should not eat or drink anything within 6 to 12 hours of your scheduled procedure. Your doctor will tell you how long you should stop eating or drinking. Food can cause vomiting during the procedure, creating complications. If you are taking medication, ask your doctor whether you should take them before the procedure. You should not smoke after midnight the day before the procedure.

You should check with your doctor about the use of aspirin or aspirin containing products, as well as over-the-counter pain medications such as Excedrin®, ibuprofen, Motrin®, Advil®, Aleve®, or similar products before and immediately after the bronchoscopy. Taking such products can increase the risk of bleeding during or after the procedure. Blood thinning medications such as warfarin, Coumadin®, Plavix®, heparin and Lovenox® may also have to be stopped for sometime depending on what your physician expects to find or do during a bronchoscopy. After your procedure, your doctor will tell you when it is safe to restart these medications.

Tell your doctor about any medical problems you have or if you are pregnant. For instance, bleeding problems or problems with the lungs and heart, may require special treatment before, during, and after a bronchoscopy.

Tell your doctor about all the medications you are taking. For instance, if you take blood thinners you may need special medications. Some patients may need to take antibiotics before the procedure. Also inform him or her if you have any allergies. This will help your healthcare team select the anesthetic for you. This is the medication that will numb you so you don't feel any pain.

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You will be asked to remove your shirt and put on a gown for the procedure. Also, if you wear glasses, dentures or partials, you will be asked to remove them before the procedure. You may want to bring an eyeglass case with you to put your glasses in. If you need one, a denture cup will be provided for you.

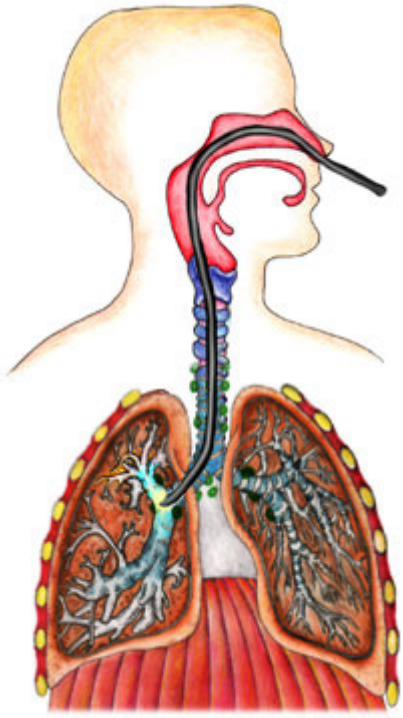
If you are not having general anesthesia, you will go home the same day of the procedure. When you are ready to go home, you should not drive a car. Arrange for somebody to drive you home.

Procedure

Before inserting the scope, the doctor usually sprays a local anesthetic into your nose and mouth. This numbs your throat. If the bronchoscope is going to be inserted through your nose, the doctor may also place an anesthetic in your nasal passages. The anesthetics start working within few minutes.

During the procedure, you may be given a sedative medication to help you relax, or you may be given a medication that will put you to sleep during the procedure. It is important for you to try to relax and take slow, deep breaths through your nose. Every effort will be made to maintain your comfort and safety. Your blood pressure, pulse, and the oxygen level in your blood will be monitored. The procedure usually takes about 30 to 60 minutes to complete.

You should feel no pain during the procedure and you will be able to breathe on your own. You will feel the pressure of the bronchoscope as it is inserted. Some patients consider the test slightly uncomfortable. However, different patients react differently to the procedure.



The doctor gently and slowly inserts the bronchoscope through your mouth or nose and moves it to the vocal cords. More anesthetic is sprayed through the bronchoscope to numb the vocal cords. You may be asked to make a high-pitched sound to help move the scope past your vocal cords. Do not talk while the bronchoscope is in your lungs.

A large X-ray machine (fluoroscope) may be placed above you to send the X-ray pictures to a video monitor. The picture on the monitor

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helps the doctor see clearly while the bronchoscope is moved through different sections of the lungs. The bronchoscope is then moved down your bronchial tubes to examine the lower air passages.

If the doctor sees suspicious tissue, he or she will take a sample for examination under the microscope. This is called a biopsy. Biopsies are helpful in examining abnormal growths to determine if they are cancerous. A biopsy needle may be used to obtain a sample of lung tissue. The biopsy results are usually available a few days later.

At the end of the examination, the doctor will withdraw the bronchoscope and you will be taken to a recovery room to wait for the effect of the anesthetic to wear off. This may take up to one hour. You will then be discharged and will be able to go home. Your doctor may give you some preliminary results before discharge. If any biopsy was done, these results may not be available before few days.

When you are ready to go home, you should not drive a car. Arrange for somebody to drive you home.

Risks

A bronchoscopy is a safe procedure. Complications are rare, however they can occur. You need to know about them just in case they happen.

Some patients may be allergic to the sedative used. Tell your doctor if you have any allergy before the procedure. This will help him or her pick the right sedative for you.

Infection and bleeding could happen. Bleeding is rare, but more likely if a biopsy is performed or if the patient takes blood-thinning medication. If it occurs, bleeding usually stops on its own but in rare cases may require blood transfusion. In extremely rare cases, surgery may be needed.

A tear in the wall of the lung can occur during the needle biopsy. If this happens, air could flow into the membrane around the lung and cause a partial collapse of the lung. This is known as pneumothorax. If the pneumothorax causes breathing problems, your doctor may have to put in a temporary chest tube. A chest tube is a

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tube that is inserted between the lung and the chest wall and allows the excess air to sucked to the outside. The tube is taken out within few days when the leak stops.

Spasms of the bronchial tubes can occur, which may make breathing difficult. Irregular heart rhythms or arrhythmias can also occur.

X-rays are used during this procedure. The amount of radiation is deemed safe. However, this amount could be dangerous for a fetus. It is therefore important to tell your doctor if you are pregnant before the procedure.

In case your doctor decides to use general anesthesia, then additional risks include nausea, vomiting, urinary retention, cut lips, chipped teeth, sore throat, and headache. More serious risks of general anesthesia include heart attacks, strokes, and pneumonia. In very rare cases, complications of general anesthesia may cause death.

Your anesthesiologist will discuss these risks with you and ask you if you are allergic to certain medications.

Blood clots in the legs can occur due to inactivity during and after general anesthesia. These usually show up a few days after the procedure. They cause the leg to swell and hurt.

Blood clots can become dislodged from the leg and go to the lungs where they can cause shortness of breath, chest pain and possibly death. It is extremely important to let your doctors know if any of these symptoms occur. Sometimes the shortness of breath can happen without warning. Getting out of bed and walking shortly after the procedure is the best way to decrease the risk of blood clots in the legs.

After the Procedure

Though you will feel stronger after you go home, you should plan on resting for the remainder of the day.

You may feel tired for a day or so after the procedure. This is normal. The medication used to numb the throat and mouth may leave you with a bitter taste in your mouth and throat. It may also give you a sensation of swelling in your tongue or back of your mouth. This should not last more than a few hours. Soreness of the throat and some

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hoarseness may last for few days though. Sucking on throat lozenges or gargling with warm salt water may help soothe your sore throat.

Your doctor will tell you how soon you can eat, drink, and resume your regular activities. Normally, you can eat after the numbing medication has worn off. It is best to try to drink water initially to make sure you do not choke on it.

Call your doctor immediately if you notice any of the following:

- You have difficulty breathing
- You cough up more than 2 tablespoon of blood.
- You have a fever higher than 100.4 °F or 38 °C that last for more than 24 hours.

Conclusion

A bronchoscopy is a safe technique for examining the airways. It can be used to diagnose and treat medical problems of the respiratory tract.

It is important to communicate with your doctor about your health condition and medications you are taking. You should also not eat or drink anything 6 to 12 hours before the procedure. Some medical conditions, such as diabetes, will affect the length of time you may eat or drink. Check with your doctor.

Thanks to advances in medical technology, bronchoscopy allows a better diagnosis than X-rays. It can also be used instead of surgery to treat some medical conditions.

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